Fig. 1

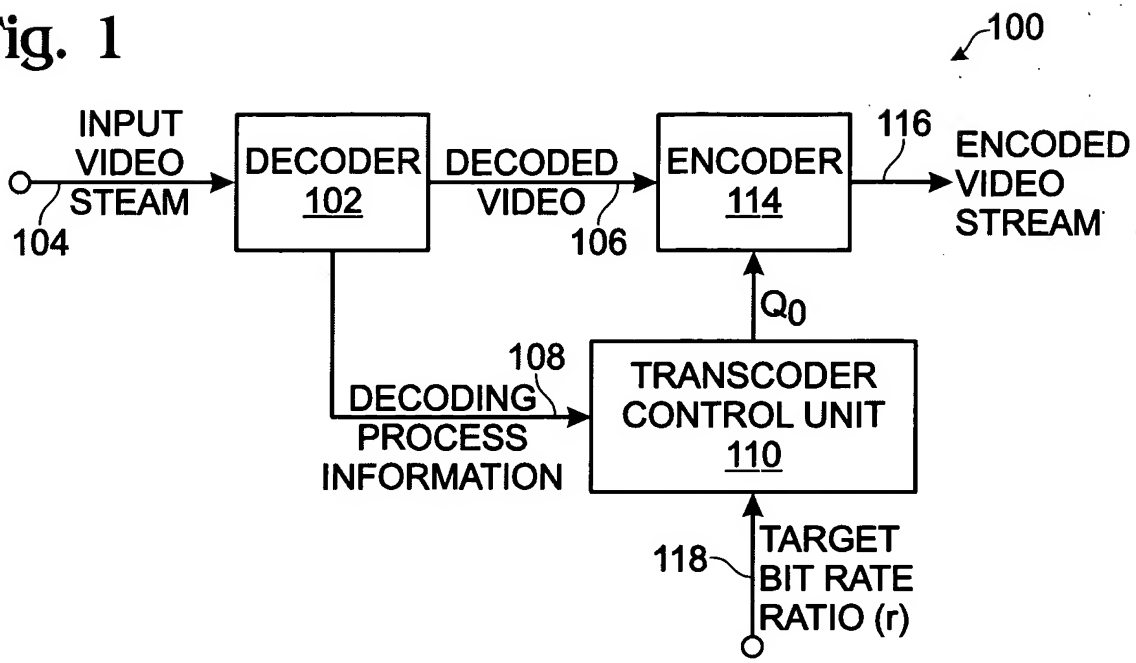


Fig. 2

STEP 1. GET THE PICTURE TYPE AND $N_{i,k}$, $Q_{i,k}$, FROM PARSED MPEG-2 STREAM

STEP 2. IF THIS IS THE FIRST TIME FOR THIS TYPE, SET $Q_{o,k}$ EQUAL TO $Q_{i,k}/r$ AND GO TO STEP SEVEN

STEP 3. UPDATE THE ACCUMULATED TARGET BITS, TARGET COMPLEXITY, ACTUAL BITS, AND ACTUAL COMPLEXITY FOR THIS PICTURE TYPE

STEP 4. COMPUTE THE COMPLEXITY RATIO $\alpha_k = \dfrac{\sum_{j=0}^{k-1} (Q_{o,j} \cdot N_{o,j})}{\sum_{j=0}^{k-1} (Q_{i,j} \cdot N_{i,j})}$

STEP 5. COMPUTE THE BIT RATE ADJUSTMENT FACTOR $B_k = \dfrac{\sum_{j=0}^{k-1} N_{o,j}}{r \cdot \sum_{j=0}^{k-1} N_{i,j}} = \dfrac{r_{k'}}{r}$

STEP 6. COMPUTE $Q_{o,k} = \dfrac{\alpha_k \cdot Q_{i,k}}{r} \cdot B_k$

STEP 7. ENCODE THIS FRAME USING $Q_{o,k}$ AS THE QUANTIZATION PARAMETER

STEP 8. REPEAT STEP ONE TO STEP SEVEN FOR ALL THE REMAINING FRAMES

Fig. 3

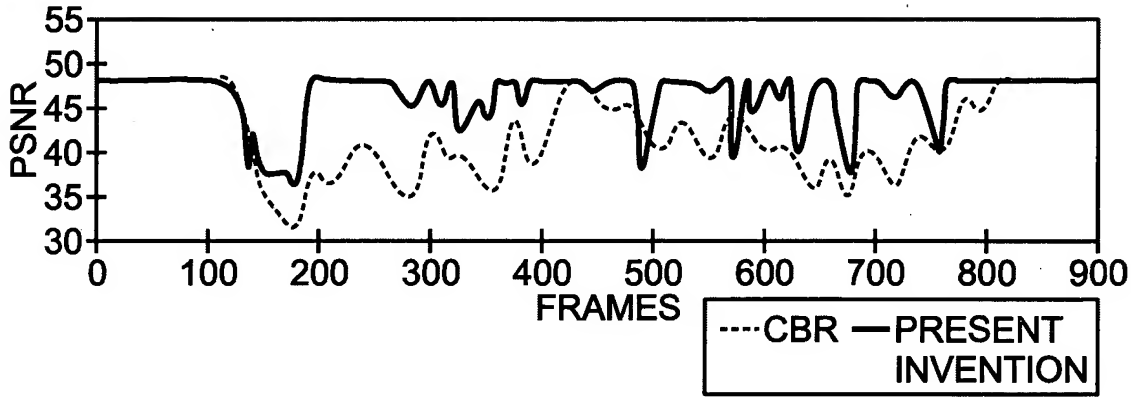


Fig. 4

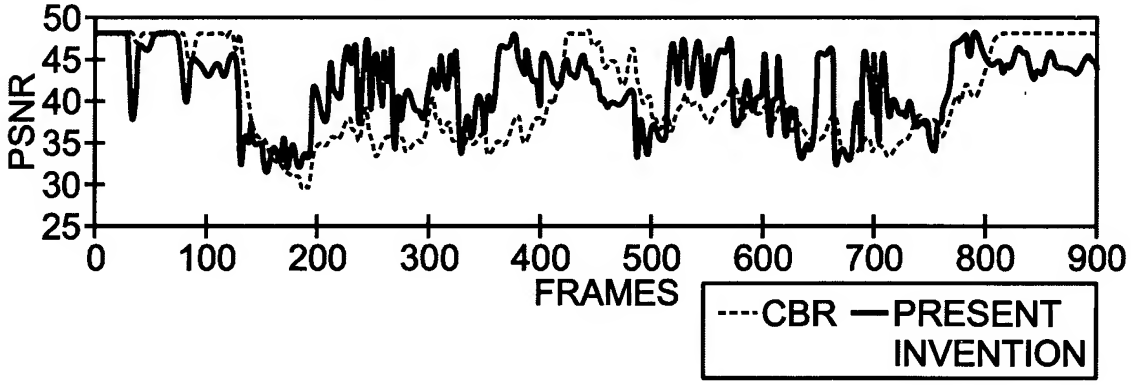


Fig. 5

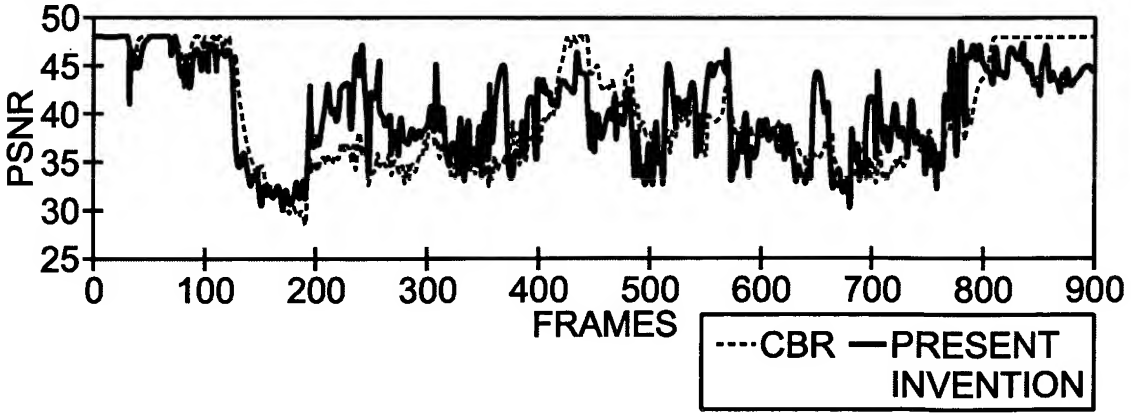


Fig. 6

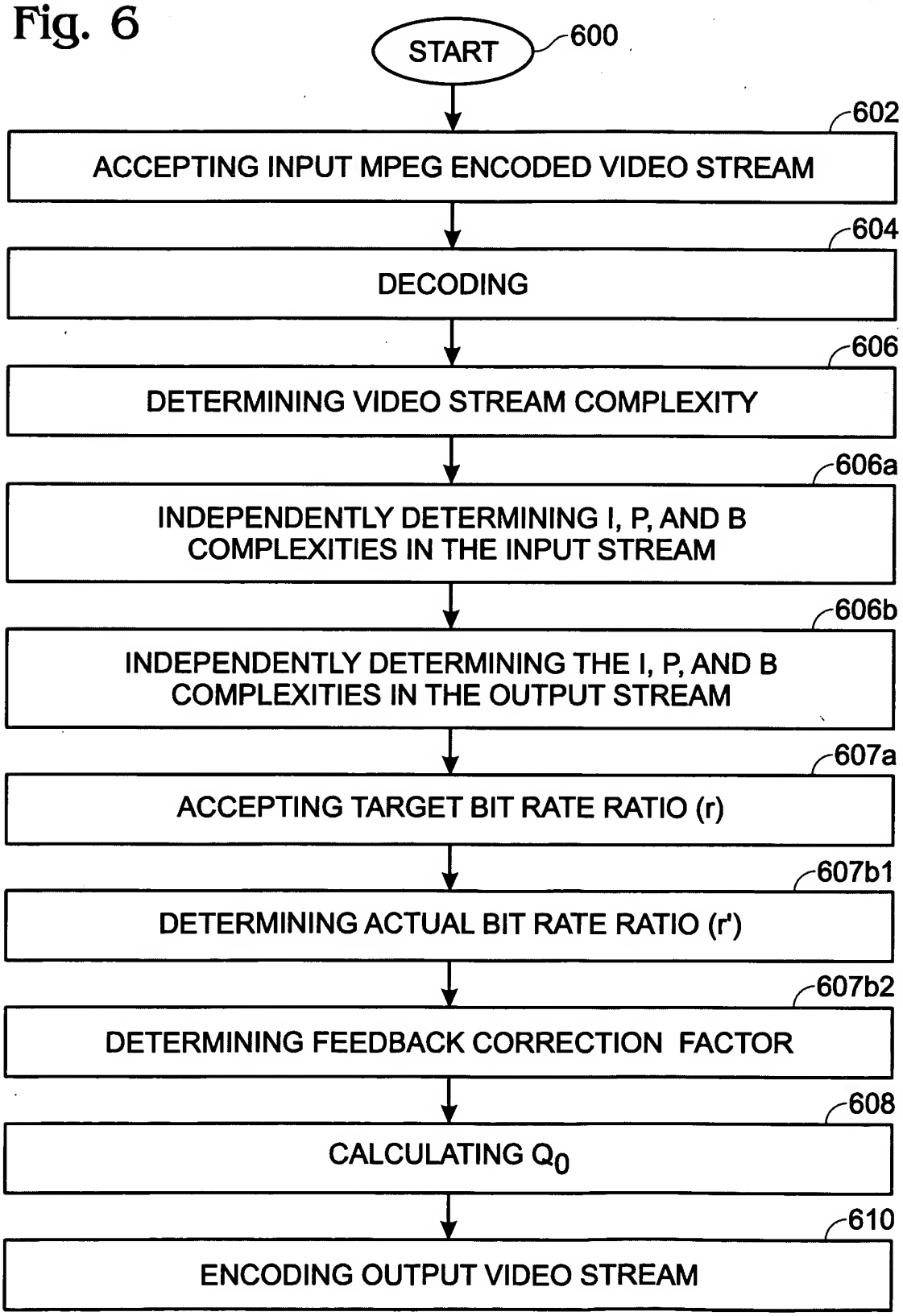
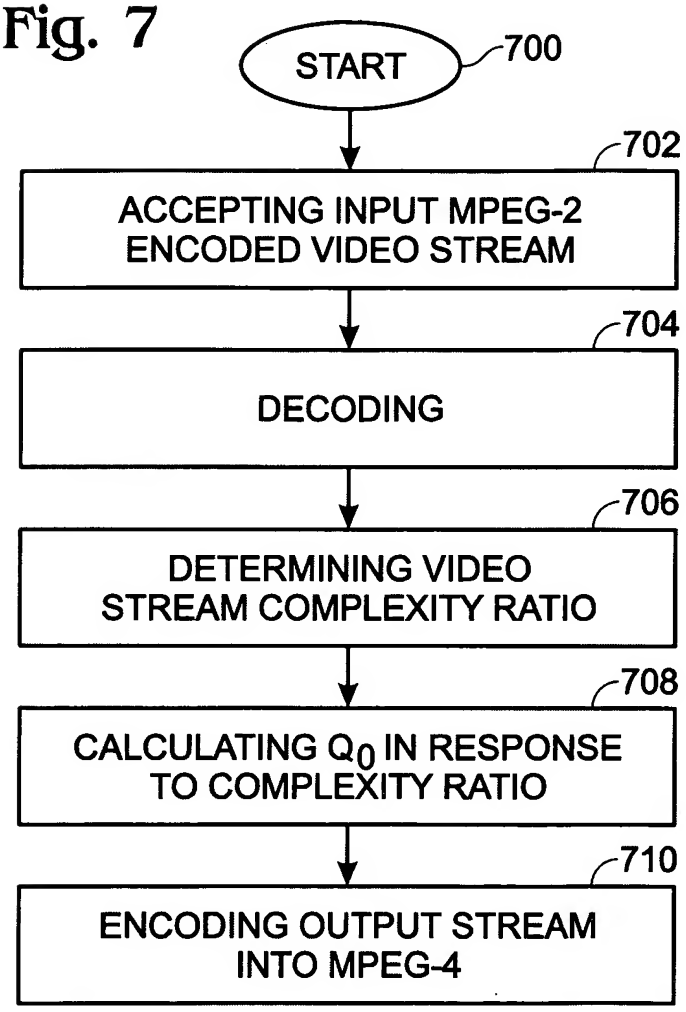

START
600
602
ACCEPTING INPUT MPEG ENCODED VIDEO STREAM
604
DECODING
606
DETERMINING VIDEO STREAM COMPLEXITY
606a
INDEPENDENTLY DETERMINING I, P, AND B COMPLEXITIES IN THE INPUT STREAM
606b
INDEPENDENTLY DETERMINING THE I, P, AND B COMPLEXITIES IN THE OUTPUT STREAM
607a
ACCEPTING TARGET BIT RATE RATIO (r)
607b1
DETERMINING ACTUAL BIT RATE RATIO (r')
607b2
DETERMINING FEEDBACK CORRECTION FACTOR
608
CALCULATING Q_0
610
ENCODING OUTPUT VIDEO STREAM

Fig. 7


START
700
702
ACCEPTING INPUT MPEG-2 ENCODED VIDEO STREAM
704
DECODING
706
DETERMINING VIDEO STREAM COMPLEXITY RATIO
708
CALCULATING Q_0 IN RESPONSE TO COMPLEXITY RATIO
710
ENCODING OUTPUT STREAM INTO MPEG-4